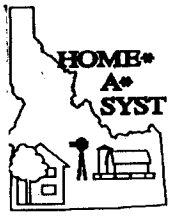

Assessing and reducing the risk of ground-water contamination from

Petroleum Product Storage

Fact/Worksheet 4

Keeping Idaho's Water Clean

Why should I be concerned?

Above ground and underground storage of liquid petroleum products such as motor fuel and heating fuel presents a threat to public health and the environment. According to the U.S. Environmental Protection Agency, nearly one out of every four underground storage tanks or piping systems in the United States may now be leaking. For an underground petroleum tank more than 20 years old, the potential for leaking increases dramatically, particularly if it's not protected against corrosion. Newer tanks and piping can also leak, especially if not installed properly.

A small gasoline leak of one drop per second can result in the release of about 400 gallons of gasoline in one year. This released gasoline may enter the ground water, where even a few quarts may be enough to severely pollute a homestead's drinking water. At low levels, fuel contaminants in water cannot be detected by smell or taste, yet the seemingly pure water may be contaminated to the point of affecting human health.

Since pesticides get more media attention than fuel contaminants, the common perception is that they pose a more significant health risk. However, petroleum fuels contain a number of potentially toxic compounds as well, including common solvents such as benzene, toluene, and xylene, and additives such as ethylene dibromide and organic lead compounds. Benzene, considered a human carcinogen, has a ground-water standard much like that of many pesticides at five parts per billion.

Preventing tank spills and leaks is especially important because of how rapidly gasoline, diesel, and fuel oils can move through surface layers and into ground water. Vapors from an underground leak that collect in basements, sumps, or other underground structures have the potential to explode. Selling property with an old underground tank may also be difficult.

This worksheet focuses on storage of gasoline, kerosene, and liquid heating fuels, as well as any related piping. It does not apply to above-ground LP (liquid propane) gas, because leaks vaporize quickly and do not threaten ground water.

The goal of Home*A*Syst is to help you protect the environment and your drinking water.

How will these materials help me to protect my ground water?

- It will take you step by step through your petroleum product storage practices.
- It will rank your activities according to how they might affect the ground water that provides your drinking water supply.
- It will provide you with easy-to-understand rankings that will help you analyze the "risk level" of your petroleum product storage practices.
- It will help you determine which of your practices are reasonably safe and effective, and which practices might require modification to better protect your drinking water.

How do I complete the worksheet?

After reviewing the information provided, follow the directions at the top of the chart on page 9. It should take you about 15 to 30 minutes to complete this worksheet and figure out your risk ranking.

Glossary

Petroleum Product Storage

These terms may help you make more accurate assessments when completing Fact/Worksheet 4. They may also help clarify some of the terms used.

Cathodic protection: One of several techniques to prevent corrosion of a metal surface by reversing the electric current that causes corrosion. A tank system can be protected by sacrificial anodes or impressed current (See **sacrificial anodes** and **impressed current**).

Certified installer/remover: A person certified by the state to install, repair, or remove petroleum storage tanks.

Corrosion: Deterioration of a metallic material ("rust") due to a reaction with its environment.

Corrosion protection: Measures taken to prevent corrosion on a steel tank.

Galvanized: The result of coating an iron or steel structure with zinc. Galvanized materials do not meet corrosion protection requirements for underground tanks.

Impressed current: A protection system that introduces an electric current into the ground through a series of anodes that are not attached to the underground tank. Because the electric current flowing from these anodes to the tank system is greater than the corrosive current attempting to flow from it, the underground tank is protected from corrosion.

Interior liner: A tank liner made of noncorrosive synthetic materials that are effective in preventing leaks in metal tanks when they corrode.

Inventory control: Measuring and comparing the volume of tank contents regularly with product delivery and withdrawal records to help detect leaks.

Protected tank: A tank approved by the underground storage tank regulatory authorities for use underground if installed according to the manufacturer's instructions. An **unprotected** tank has not been installed to the manufacturer's instructions.

Regulated tank: A tank, which because of its size, use and/or location, requires registration with a state or local agency. Not all tanks are subject to regulation.

Sacrificial anodes: Pieces of metal attached directly to an underground tank to prevent corrosion. Sacrificial anodes deflect corrosion-causing electrical currents from the underground storage tank.

Secondary containment: A system designed to catch and hold the contents of a tank if it leaks or ruptures.

Soil permeability: Characteristic of a soil to transmit water or air. Slowly permeable soils have fine-textured materials (clays) that permit only slow movement. Moderately or highly permeable soils have coarse-textured materials (sands) that permit rapid movement.

Spill and overfill protection: Spill protection usually consists of a catch basin for collecting spills when the tank is filled. Overfill protection is a warning which helps prevent an overfill, such as an automatic shutoff or buzzer. These precautions can prevent the pollution of the ground water.

Tank tightness testing: A procedure for testing a tank for leaks to identify any accidental release of any stored substance into the environment, or intrusion of ground water into an underground tank.

Keeping Idaho's Water Clean

Improving Petroleum Product Storage

1. Storage tank location

The distance between your liquid petroleum storage tank and your drinking water well is vitally important to reducing the risk of ground-water contamination. Petroleum storage tanks should be located at least 50 feet from a public water well according to state regulations. Existing wells are required by law to meet separation requirements in effect at the time they were constructed. Make every effort, however, to exceed the regulations whenever possible.

One gallon of gasoline containing one percent benzene can contaminate about two million gallons of ground water. Preventing spills and leaks is especially important because gasoline can move quickly through the soil. Although diesel fuel and fuel oil are more dense than gasoline and move more slowly through the soil, they too will eventually reach ground water.

Every site has unique geologic and hydrologic conditions that can affect ground-water movement. Petroleum products reach ground water more quickly if local soil is permeable. Sands and gravels are examples of permeable soils. Figure 1 illustrates petroleum product seepage into soils. It is preferable to locate a new tank at least 200 to 400 feet away from your well or your neighbor's well, to provide reasonable assurance that subsurface flow or seepage of contaminated ground water will not reach your well. If possible, the tank should also be located downslope from the well.

Regulations for siting above ground storage tanks are concerned more with the explosion potential of tanks than the ground-water pollution potential. To protect against explosion and fire, follow local siting regulations. Following state and federal regulations and recommendations can better protect the ground water supplying your well.

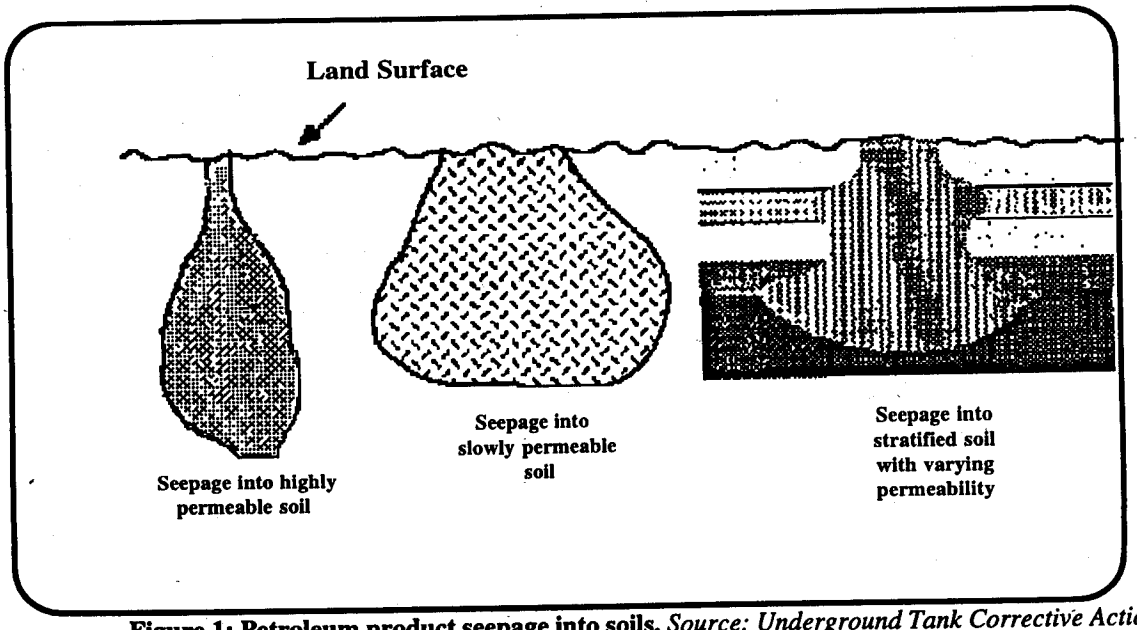

Figure 1: Petroleum product seepage into soils. *Source: Underground Tank Corrective Action Technologies, EPA/625/6-87-015, January 1987.*

New storage tank location

In addition to maintaining an adequate distance from your drinking water well or neighbor's well, choose a location for a new tank based on the following considerations:

- **Soil characteristics.** New underground storage tanks are required to be installed using backfill materials recommended by the manufacturer. Use clean backfill during installation to decrease the negative effects of surrounding soils. Highly corrosive clays, wet soils, and acid (low pH) soils can significantly speed up the rate of corrosion of unprotected underground metal tanks and piping.

- **Soil stability.** Assess the ability of the underlying soil to support both underground and above ground tanks. Properly anchor tanks in special locations, such as hillsides. Be sure that pipes cannot twist or break if the tank is bumped or disturbed.

- **Depth to groundwater.** Floodways or areas where the water table is close to the surface are poor locations for storage tanks. Tanks placed in such areas require special installation. To reduce pollution potential, an above ground tank may be preferable to an underground tank in these situations.

- **Current and previous land use.** Sites that contain abandoned pipes and tanks, agricultural drainage tiles, or waste materials pose special installation problems. Any metal already in the ground at your chosen site will increase corrosion rates for the unprotected tank.

- **Traffic.** Assess traffic patterns around the tank. Determine whether the location of the tank or dispenser will block movement of farm vehicles during refueling or cause special problems if any work needs to be done on the tank. Protect the tank and piping from collisions with farm and fuel vehicles.

2. Tank design and installation

Whenever you install a fuel storage tank, carefully follow the manufacturer's recommended practices for installation. Proper installation is one way to minimize the leaking potential of the tank or the piping connected to it. Scratches on a metal tank that were caused by careless installation can increase corrosion and tank deterioration.

Most underground storage tanks with more than 1,100 gallons capacity (except tanks with heating oil which is consumed on site) must be registered with the Division of Environmental Quality (DEQ). Registration of new underground storage tank installations must be filed with the DEQ within 30 days of bringing such tank into use. Underground tanks are not designed to be used above ground, and are unsafe for such use.

Underground tanks

Federal law requires that new regulated underground petroleum storage tanks and all related piping used on a rural homestead must be constructed of approved materials such as fiberglass or steel with corrosion protection. A tank is considered to be "underground" if ten percent or more of the volume, including the pipes, is below the surface of the ground. **All regulated existing underground tanks and metallic product lines must have corrosion protection by December 23, 1998, if they are to remain in use.** Corrosion protection systems must be designed by a corrosion expert. Even if your tank system is not covered by these regulations, it is important that these design standards be followed.

Corrosion and its prevention

Corrosion (rust) is the deterioration of a metallic material due to a reaction with its enviroment. Corrosion damage to tanks is caused when a metal underground tank and its underground surroundings act like a battery. Part of the tank can become negatively charged, and another part positively charged. Moisture in the soil provides the connecting link that finally turns these tank "batteries" on. Then the negatively charged part of the underground tank system, where the current exits from the tank or its piping, begins to deteriorate. As electrical current passes through this part, the hard metal begins to turn into soft ore, holes form, and leaks begin.

Steel underground tanks can be protected from corrosion if they are bonded to a thick layer of noncorrosive material, such as **fiberglass reinforced plastic**. Also, the corrosion problem can be entirely avoided by using tanks made of noncorrosive material, such as fiberglass.

Other methods of corrosion protection include cathodic protection systems (sacrificial anodes) or internal lining.

- A **sacrificial anode** is a special material connected to the tank that is more electrically active than the steel tank. Because the anode is more active, electric current runs from the anode rather than from the tank. The tank becomes the cathode (positive electrode) and is **protected** from corrosion. The attached anode (negative anode) is "sacrificed" or consumed in the corrosion process. This method should only be used on new steel tank installations. Corrosion protection experts generally agree that sacrificial anodes do not work effectively or economically with most existing steel underground storage systems.

- **Interior liners** are made of noncorrosive synthetic materials and can also be effective in protecting metal tanks. Liners must be internally inspected according to regulations or combined with a cathodic protection system.

- **Impressed current** (*Figure 2*) is a corrosion protection system that introduces an electric current through a rectifier into the ground through a series of anodes that are not attached to the underground storage tank (UST). This current is sent through an insulated wire to the anodes, then flows through the soil to the underground tank system, and returns to the rectifier through an insulated wire attached to the UST. The UST system is protected because the current going to the UST system overcomes the corrosion-causing current normally flowing away from it.

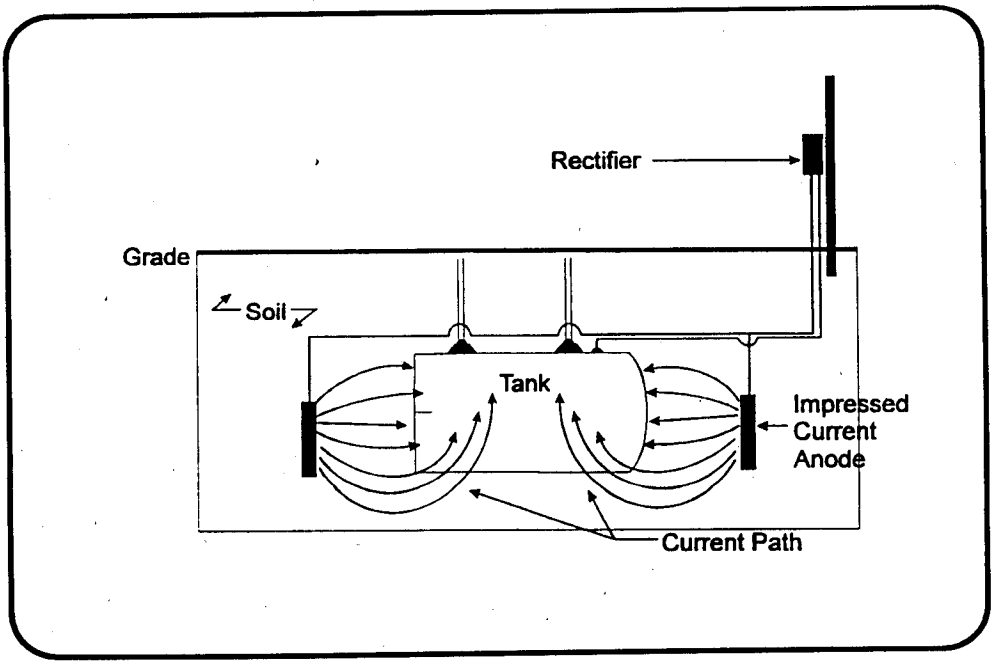

Figure 2

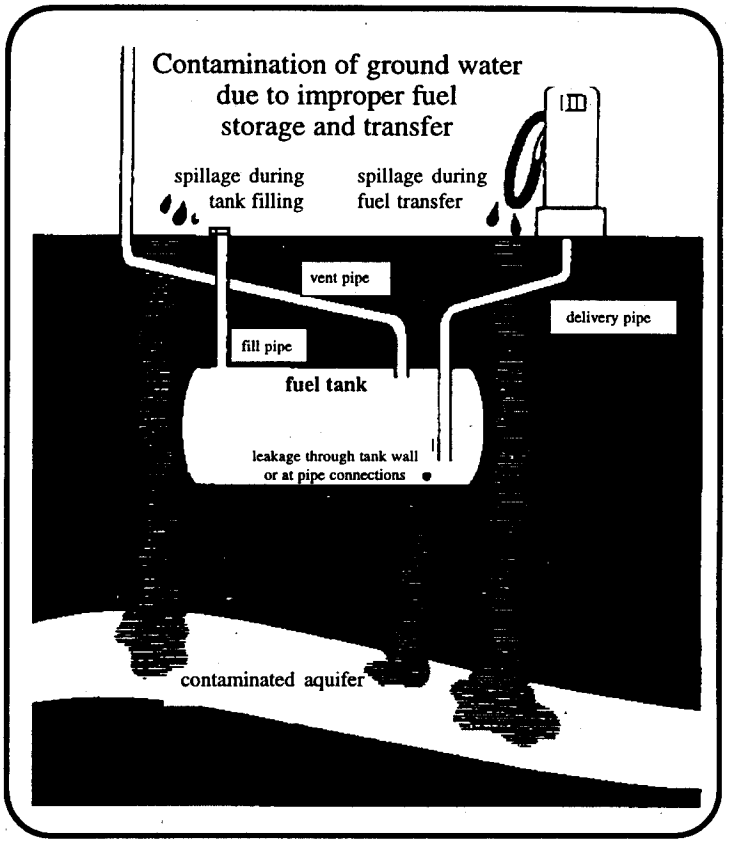

Figure 3: Contamination of ground water due to improper fuel storage and transfer.
Source: Handling and Underground Storage of Fuels, Cooperative Extension Service, Michigan State University, Extension Publication WQ01. Reprinted February 1986.

Spill/Overfill prevention

Federal law requires that all new farm and residential underground tanks designed to hold 1,100 gallons or more (other than heating oil) have spill and overfill protection. Spill protection typically consists of a catch basin for collecting spills when filling the tank. Overfill protection is a warning or prevention of an overfill and must either automatically shut off the flow of product when the tank is 95 percent full or alert the operator when the tank is 90 percent full. Spill and overfill protection are important and relatively inexpensive; they can prevent a number of small releases over a long period of time from polluting the ground water. Figure 3 shows how ground water can be contaminated by underground tank systems.

Above ground tanks

Regulations for above ground tank installation seek to reduce the potential for fire. To decrease ground-water pollution potential, place farm tanks within a secondary containment. Secondary containment can be a double-walled tank or a structure consisting of a dike and a pad. Piping should be made of cathodicly protected steel, coated to prevent corrosion.

Above ground tanks and their installation are affected by a mosaic of local and federal regulations. The manufacturing of above ground tanks is self-regulated by the industry, with oversight provided by Underwriters Laboratories (UL). Industry standards for above ground storage tanks are detailed in UL 142. The best source of information on proper siting and installation of above ground storage tanks are local authorities, especially the local fire chief or State Fire Marshal.

3. Monitoring

Rules for regulated underground tanks require that tanks have a method of detecting leaks. Select the tank location carefully to ensure ease of installation and reliability of chosen leak detection methods. Test the tank periodically for leaks, and measure the tank inventory to help detect leaks before major problems develop.

Inventory control must be performed every operating day for underground systems which store and dispense fuel on a regular basis. While inventory measurement will not detect very small leaks, it will at least provide a warning that further investigation may be necessary.

Since cleanup of fuel leaks is always costly and often not totally effective, it is important to constantly monitor underground tanks containing petroleum products. If you have an underground petroleum storage tank on your property, be especially aware of the age of your tank as well as the need to establish a leak detection program.

Most existing tanks used on homesteads are bare steel. Because of this, tank or piping corrosion problems will eventually cause leaks. If your tank is more than 10 years old or if you don't know its age, make a special effort to determine whether leaks exist.

Existing regulations and good practice require that you use a method to detect leaks regularly. Release detection requirements can be met by a combination of annual tightness testing and inventory control, or through either automatic tank gauging, soil vapor monitoring, or other approved methods. Copies of the actual regulations, as well as release detection requirements and methods, are available by contacting DEQ at (208) 373-0502, or the DEQ regional office for your area (see *Contacts and References* section).

Protection of the ground-water resource is the most important consideration of a leak detection system. The closer the tank is to the homestead's drinking water well, the more important it is to ensure that an adequate leak detection system is in place.

Leaks and spills

If you find a leak or spill from an underground storage tank, state law requires that you notify the DEQ regional office for your area. First, contact your local fire department then take whatever actions are necessary to remedy the problem. Follow recommendations you receive when you report the spill or leak.

A leak or spill from an above ground storage tank is generally dealt with by a designated local emergency management agency, such as the fire department. Contact your local fire district and DEQ in case of an above ground leak or spill.

If your storage tank holds oil and has the "reasonable" potential to leak into navigable waters of the United States (e. g., Snake River), you may be required by the Environmental Protection Agency (EPA) to have a Spill Prevention Control and Countermeasure Plan (SPCC). An above ground storage tank with a capacity greater than 660 gallons, an above ground facility with a capacity greater than 1,320 gallons, or an underground storage tank with a capacity greater than 42,000 gallons must have an SPCC.

4. Insurance

Federal law requires that certain underground storage tank owners obtain pollution liability insurance so that releases can be cleaned up in a timely manner. Contact the Petroleum Storage Tank Fund at (208) 334-2370 for more information about the state sponsored program that can help you meet this requirement.

5. Underground tank removal and closure

Tanks that are no longer in use can cause problems for owners and operators many years later. They will continue to corrode and, if they still contain gas or oil, will likely contaminate ground water.

Try to determine the location of any unused tanks on your property. Also try to find out whether the tanks still hold materials or have holes. These tanks must be pulled from the ground and disposed of, or closed in place. Check to see if local ordinances prohibit the in-place closure of buried storage tanks before deciding which option to pursue.

State law requires that only certified removers pull or close in-place farm and residential regulated tanks with over 1,100 gallons capacity, unless the owner does all work and follows industry standards. An environmental site assessment is required, and DEQ must be notified 30 days before any regulated tank can be removed or closed in place. As part of the underground storage tank removal process, all associated buried piping should be removed.

In addition, notify your local fire department at least 30 days before pulling or closing any petroleum tank. This will ensure that precautions are taken to prevent an explosion or other problem. Deaths have occurred due to improper closure or pulling of a tank. The importance of safety during removal or closure should not be overlooked.

You should document steps you take to legally close your tank — including notifying DEQ that the tank has been closed — so that you are protected from legal action.

Any questions regarding underground storage tank removal or in-place closure should be directed to DEQ (208) 373-0502 or to the DEQ regional office for your area (see *Contacts and References* section).

Worksheet 4

Petroleum Product Storage: Assessing Drinking Water Contamination Risk

1. Use a pencil. You may want to make changes.
2. For each category listed on the left that is appropriate to your homestead, read across to the right and **circle** the statement that **best** describes conditions on your homestead (skip and leave blank any categories that don't apply to your homestead).
3. Then look above the description you circled to find your "rank number" (4, 3, 2, or 1) and enter that number in the blank under "your rank."
4. Complete section "What do I do with these rankings?"
5. Allow about 15–30 minutes to complete the worksheet and figure out your risk ranking for petroleum product storage practices.

	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	YOUR RANK
LOCATION *(Addressed in Section 1)*					
Position of tank in relation to drinking water well	Tank more than 400 feet downslope from well.	Tank less than 400 feet, but more than 150 feet downslope from well.	Tank less than 150 feet, but more than 50 feet downslope from well.	Tank less than 50* feet or upslope from well.	____
Site characteristics of tank location **Soil type:**	Medium- or fine-textured soils (silt loam, loam, clay loams, silty clay) with low permeability.**	Medium- or fine-textured soils with moderate permeability.**	Coarse-textured soils (sand, sandy loam) with moderate-permeability.**	Coarse-textured soils with high permeability.**	____
Water table depth:	Greater than 99 feet	50-99 feet	20-49 feet	Less than 20 feet	____
DESIGN AND INSTALLATION *(Addressed in Section 2)*					
Type and age of tank/ corrosion protection *(Underground tanks)*	Double-walled tank.	Single walled steel tank with cathodic protection or fiberglass tank.	Unprotected single walled steel tank equal to or less than 10 years of age.	Unprotected single walled steel tank greater than 10 years of age.	____
Above-ground tanks	Doubled-walled tank placed within concrete or synthetic dike with pad able to hold 110 percent of tank capacity. UL 142 labeled.	Tank placed within dike and pad lined with low permeability soils,** able to hold 110 percent of tank capacity. UL 142 labeled.	Tank placed on pad with no dike. UL 142 labeled.	No secondary containment. Not UL 142 labeled.	____

*Illegal for new public water supply well installation. Existing wells must meet separation requirements in effect at time of construction.
**Low permeability soils like clay allow water to flow through slowly. High permeability soils like sand and gravel allow much faster water movement.

	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	YOUR RANK
DESIGN AND INSTALLATION (*continued*)					
Underground piping	FRP* **or** steel piping with cathodic corrosion protection. Isolated from tank, sloped back to tank **and** suction system with check valve at pump. Double-walled pipe.	Metal pipe with suction system. Pipe drains back to tank. Check valve at pump.	Metal pipe with suction system. Pipe drains back to tank. Check valve at tank.	Piping and tank of dissimilar materials. Pipe cannot drain freely to the tank. Single-walled, pressurized pipe system.	_____
Above-ground piping	Steel pipe with anti-siphon protection and bumper guards.	Steel pipe with anti-siphon protection.	Metal pipe and hose.	Nonmetal pipe.	_____
Tank installation	*Underground tank*- installed by state-certified installer. *Above-ground tank*- inspected by appropriate authority.	Installed according to recommendations supplied with new tank by seller.	Installed without consulting guidelines for given application.	Installed without backfill, setback, secondary containment, anchors, and other protections, or by untrained individual. No information on installation.	_____
Spill and tank overfill protection	Designed spill containment. Overfill alarm with automatic shutoff.	Designed spill containment. Overfill alarm **or** automatic shutoff.	Either designed spill containment or overfill protection.	No protection.	_____
Above-ground tank security enclosure	Tank surrounded by enclosure as required by Uniform Fire Code.	Tank surrounded by fence with lock.	Tank surrounded by fence. No lock.	No enclosure.	_____

* Fiberglass reinforced plastic.

	LOW RISK (rank 4)	LOW-MOD RISK (rank 3)	MOD-HIGH RISK (rank 2)	HIGH RISK (rank 1)	YOUR RANK
MONITORING *(Addressed in Section 3)*					
Tank integrity testing and leak detection monitoring	Active leak detection system in place.	Regular inventory control and annual tank tightness testing.	Occasional inventory control and annual tank tightness testing.	No inventory control, testing, or monitoring.	_____
UNDERGROUND TANK REMOVAL AND CLOSURE *(Addressed in Section 5)*					
Unused underground tank	Tank taken from ground according to regulations and by a state certified remover. Excavation checked for evidence of contamination and any contamination reported to the state.*	Tank contents emptied and tank filled with inert material. Any contaminated material around site removed.*	Tank removed or filled with inert material. Excavation and site not checked for contamination.	Tank not properly removed, or improperly abandoned in-place.	_____

* Petroleum releases are to be reported to the Division of Environmental Quality within 24 hours. Cleanup action may or may not be required depending on the type and extent of the release.

What do I do with these rankings?

Step 1: In the table below summarize your risk scores by checking the appropriate box for each category you answered on this worksheet.

Petroleum Product Storage Risk Rankings Summary

CATEGORY	Risk Rank			
	Low 4	3	2	High1
Position of tank in relation to well				
Site characteristics of tank location: Soil type:				
Water table:				
Type and age of tank, corrosion protection				
Above-ground tanks				
Underground piping				
Above-ground piping				
Tank installation				
Spill and tank overfill protection				
Above-ground tank security enclosure				
Tank testing and leak monitoring				
Unused underground tank				

Step 2: Look over your rankings for individual activities.

High Risk Practices (1) Pose a high risk for your health and for contaminating ground water.

Moderate to High Risk Practices (2) Are inadequate protection in many circumstances.

Low to Moderate Risk Practices (3) Provide reasonable ground-water protection.

Low Risk Practices (4) Are ideal; try to make this your goal.

Any categories ranked in the shaded areas should be carefully reviewed. Some concerns you can take care of right away; others could be major or costly projects, requiring planning and prioritizing before you take action. The long term goal of the Home*A*Syst program is to improve homestead practices and structures so that they are classified as low risk. Activities classified as low risk generally reflect best management practices.

Transfer any activities that you ranked in the shaded areas in step 1 to the "High-Risk Activities" on pages two, three, and four of Worksheet B.

Step 3: Read the materials provided in this document. If you haven't already, consider how you might modify your homestead practices to better protect your drinking water.

Contacts and References
Who to call about...

Underground storage tank registration, reporting closure and changes in tank ownership, and general information:

• Idaho Division of Enviromental Quality (DEQ) (208) 373-0502.

Above ground storage tank siting and installation

• Contact your local fire department or State Fire Marshal (208) 334-4370 for information on proper siting and installation of above ground tanks.

Environmental Protection Agency regulations

• U. S. EPA Region X, (800) 424-4372 or Idaho Operation's Office (208) 334-1450.

Petroleum storage tank insurance

• Contact Petroleum Storage Tank Fund (208) 334-2370.

Petroleum product spills from underground storage tanks

• Releases from underground storage tanks must be reported to the appropriate DEQ regional office within 24 hours. The reporting numbers for the regional offices are:

North (Coeur d'Alene):	(208) 769-1422
North Central (Lewiston):	(208) 799-4370
Southwest (Boise):	(208) 373-0550
South Central (Twin Falls):	(208) 736-2190
Southeast (Pocatello):	(208) 236-6160
Eastern (Idaho Falls):	(208) 528-2650

Effects of gasoline-contaminated ground water

• U.S. Environmental Protection Agency's Safe Drinking Water Hotline. Call toll free, (800) 426-4791 from 6:30 a.m. to 3:00 p.m. Mountain Standard Time.

Fire protection

• Contact your local fire department or State Fire Marshal (208) 334-4370.

Spanish language

- *Normas Y Procedieentos Para TSA. (3)*

Publications available from...

- Your county Cooperative Extension System office. There may be charges for publications, postage, and sales tax.
- Division of Environmental Quality, Underground Storage Tank Program, 1410 N. Hilton, Boise, Idaho 83706, (208) 373-0260.
- U.S. Environmental Protection Agency-Region X, 1200 6th Ave., Seattle, Washington, 98101, (800) 424-4372.
- Petroleum Equipment Institute, P.O. Box 2380, Tulsa, Oklahoma 74101, (918) 494-9696.

What to read about...

Publications are available from sources listed at the end of the reference section. Refer to number in parentheses for the source of each publication.

Ground water contamination, protection, and testing

• *Idaho Cleanup Requirements for Petroleum Contaminated Soil,* Idaho UST Information Series: #1. (2)
• *Idaho Petroleum Release Response and Corrective Action Requirements,* Idaho UST Information Series: #2. (2)
• *Guidelines for TPH Analysis of Petroleum Contaminated Soils,* Idaho UST Information Series: #5. (2)
• *Protocol for Sampling and Analysis of Used Oil,* Idaho UST Information Series: #6 (2)

Tank design, installation, and site selection

• *Recommended Practices for Installation of Underground Liquid Storage Systems.* 1994. Petroleum Equipment Institute, PEI/RP 100-94. $15, includes shipping. (4) Eleven-chapter technical document, including detailed steps and diagrams, covering such areas as material handling, release detection, cathodic protection, and testing and training.

• *Recommended Practices for Installation of Aboveground Storage Systems at Motor Vehicle Fueling Sites*, 1992. PEI/RP 200-92. $15, plus shipping. (4)

• *Storage and Dispensing of Flammable and Combustible Liquids on Farms and Construction Projects*, Uniform Fire Code, Article 79, Division 10. The Uniform Fire Code was developed by the International Fire Code Institute and has been adopted by most western states as the state fire code.

• *UL (Underwriter's Laboratory) 142: Standard for Safety. Steel: Aboveground Tanks for Flammable and Combustible Liquids.* Details the UL design standard for above-ground storage tanks. A copy of the standard can be obtained for a fee from UL by calling (708) 272-8800.

Tank regulations, testing, closure, and financial responsibilities

• *Musts for USTs: A Summary of New Regulations for UST Systems.* (2, 3)
• *Dollars and Sense: A Summary of Financial Responsibility for UST Systems.* (2, 3)
• *Unused Underground Residential Heating Oil Tanks,* Idaho UST Information Series: #8 (2)
• *Don't Wait Until 1998: Spill, Overfill, and Corrosion Protection for Underground Storage Tanks. (2,3)*
• *Straight Talk on Tanks: Common Questions on Leak Detection (2)*
• *Doing Inventory Control Right: For Underground Storage Tanks (2,3)*
• *Manual Tank Gauging: For Small Underground Storage Tanks (2,3)*
• *Recommended Practices for Site Assessments During Closure of Underground Storage Tanks Containing Petroleum, Idaho UST Information Series: #3 (2)*
• *Permanent Tank Closure, Idaho UST Information Series: #4 (2)*

The Homestead Assessment System is a cooperative project developed, coordinated, and supported by the following agencies and organizations:

Idaho Association of Soil Conservation Districts (IASCD)
Idaho Department of Agriculture (IDA)
Idaho Department of Health and Welfare-Division of Environmental Quality (IDHW-DEQ)
Idaho Department of Water Resource (IDWR)
Idaho Public Health Districts
Idaho Soil Conservation Commission (SCC)
Idaho Water Resources Research Institute (IWRRI)
University of Idaho-Cooperative Extension System (CES)
USDA-Farm Service Agency (FSA)
USDA-Natural Resources Conservation Service (NRCS)
USDA-Rural Economic and Community Development (RECD)
U.S. Environmental Protection Agency (EPA)

Adapted for Idaho from material developed by the **Washington Home *A* Syst and Wisconsin Farm*A*Syst Programs. Idaho Home*A*Syst** development was supported by the **National Farmstead Assessment Program.**

Information derived from **Home*A*Syst** worksheets is intended only to provide general information and recommendations to rural residents regarding their own homestead practices. All results are confidential.